

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1. (currently amended) A chemical treatment method by which a metal film formed on a substrate is etched into a predetermined pattern comprising:

(a) providing a material comprising a first metal film coated on a substrate and a second metal film formed on said first metal film, said first metal film having a metal passivated layer on an exposed surface thereof, said first metal film being formed from a metal selected from the group consisting of chromium, titanium, tungsten, palladium and molybdenum, or an alloy thereof, said second metal film having a predetermined pattern,

(b) immersing said material in an acidic reduction treatment solution containing an acid radical ~~or an alkaline reduction treatment solution containing a halogen ion~~, connecting a metal portion of said material to an electrolytic circuit such that said material is a cathode and applying an electric current to

carry out an electrolysis, thereby producing nascent hydrogen, whereby said nascent hydrogen reduces said metal passivated layer to said first metal or an alloy thereof; and then

(c) etching the first metal film by contacting an exposed portion of said first metal or an alloy thereof with an acidic etching treatment solution to form the predetermined pattern.

Claim 2. (currently amended) A method according to claim 1, whereby in step (b), ~~is carried out with~~ the acidic reduction treatment solution ~~which~~ comprises a compound selected from the group consisting of hydrochloric acid, sulfuric acid, carboxylic acid, hydrofluoric acid and phosphoric acid.

Claim 3. (canceled)

Claim 4. (previously presented) A method according to claim 1, wherein the acidic etching treatment solution contains a halogen ion.

Claim 5. (previously presented) A chemical treatment method by which a metal film formed on a substrate is etched into a predetermined pattern comprising:

(a) providing a material comprising a first metal film coated on a substrate and a second metal film formed on said first metal film, said first metal film having a metal passivated layer on an exposed surface thereof, said first metal film being formed from a metal selected from the group consisting of chromium, titanium, tungsten, palladium and molybdenum, or an alloy thereof,

(b) immersing said material in a reduction treatment solution containing a halogen ion, connecting a metal portion of said material to an electrolytic circuit such that said material is a cathode and applying an electric current to carry out an electrolysis, thereby producing nascent hydrogen, whereby said nascent hydrogen reduces said metal passivated layer to said first metal or an alloy thereof; and

(c) dipping said material into an acidic etching treatment solution so that an exposed portion of said first metal or an alloy thereof is in contact with said acidic etching treatment solution to form a predetermined pattern.

Claim 6. (previously presented) A method according to claim 5, wherein the acidic etching treatment solution contains a halogen ion.

Claim 7. (previously presented) A method according to claim 6, wherein the halogen ion in the acidic etching treatment solution is a chloride ion.

Claim 8. (currently amended) A method according to any one of claims 1 ~~[[to]]~~ , 2, 4, 5 or 6, wherein in step (b), a portion of the first metal film on said material is dipped into an acidic reduction treatment solution containing a halogen ion.

Claim 9. (previously presented) A method according to claim 8, wherein the first metal film is chromium.

Claim 10. (previously presented) A method according to claim 8, wherein the first metal film is an alloy of chromium.

Claim 11. (previously presented) A chemical treatment method by which a metal film formed on a substrate is etched into a predetermined pattern comprising:

(a) providing a material comprising a first metal film coated on a substrate and a second metal film formed on said first metal film, said first metal film having a metal passivated layer on an exposed surface thereof, said first metal film being formed from a metal selected from the group consisting of chromium, titanium, tungsten, palladium and molybdenum, or an alloy thereof, and

(b) dipping said material in an acidic treatment solution containing a halogen ion, connecting a metal portion of said material to an electrolytic circuit for a predetermined time such that said material is a cathode and applying an electric current to carry out an electrolysis, thereby producing nascent hydrogen, whereby said nascent hydrogen reduces said metal passivated layer to said first metal or an alloy thereof, to form a predetermined pattern.

Claim 12. (currently amended) A method according to any one of claims 1 ~~[[to]]~~ , 2, 4, 5 or 11, wherein the first metal film is chromium.

Claim 13. (currently amended) A method according to any one of claims 1 ~~[[to]]~~ , 2, 4, 5 or 11, wherein the first metal film is formed from an alloy containing chromium.

Claim 14. (original) A method according to claim 11, wherein the halogen ion is a chloride ion.

Claims 15 to 23. (canceled)

Claim 24. (previously presented) A method according to claim 4, wherein the halogen ion in the acidic etching treatment solution is a chloride ion.

Claim 25. (previously presented) A method according to claim 5, wherein the halogen ion in the reduction treatment solution is a chloride ion.

Claim 26. (canceled)

Claim 27. (previously presented) A method according to claim 1, wherein the first metal film comprises a nickel chromium alloy.

Claim 28. (previously presented) A method according to claim 5, wherein the first metal film comprises a nickel chromium alloy.

Claim 29. (previously presented) A method according to claim 11, wherein the first metal film comprises a nickel chromium alloy.

Claim 30. (new) A chemical treatment method by which a metal film formed on a substrate is etched into a predetermined pattern comprising:

(a) providing a material comprising a first metal film coated on a substrate and a second metal film formed on said first metal film, said first metal film having a metal passivated

layer on an exposed surface thereof, said first metal film being formed from a metal selected from the group consisting of chromium, titanium, tungsten, palladium and molybdenum, or an alloy thereof, said second metal film having a predetermined pattern,

(b) immersing said material in an alkaline reduction treatment containing a halogen ion, connecting a metal portion of said material to an electrolytic circuit such that said material is a cathode and applying an electric current to carry out an electrolysis, thereby producing nascent hydrogen, whereby said nascent hydrogen reduces said metal passivated layer to said first metal or an alloy thereof; and then

(c) etching the first metal film by contacting an exposed portion of said first metal or an alloy thereof with an acidic etching treatment solution to form the predetermined pattern.

Claim 31. (new) A method according to claim 30, wherein in step (b), the alkaline reduction treatment solution which contains a halogen ion is selected from the group consisting of

sodium chloride solution, potassium chloride solution and potassium iodide solution.

Claim 32. (new) A method according to claim 31, wherein the alkaline reduction treatment solution which contains a halogen ion is potassium chloride solution.

Claim 33. (new) A method according to claim 30, wherein the first metal film is chromium.

Claim 34. (new) A method according to claim 30, wherein the first metal film is an alloy of chromium.

Claim 35. (new) A method according to claim 30, wherein the first metal film comprises a nickel chromium alloy.